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I cannot but suspect that the performance of this telescope is affected by temperature, and that severe tests in the summer months might afford different conclusions to those which I have arrived at ; but as I considered my opinion was desired on the instrument in its present state, I took no means for applying artificial heat. And, perhaps, the secondary spectrum which haunts the field might be mitigated, and the prismatic colours destroyed, by an alteration of the distance between the fluid and outer lenses ; but the same consideration prevented my applying for a screw, by which it might have been effected.

But there is one condition of the instrument which, if correct, would be of greater importance than the rest, as connected with this Report. It strikes me forcibly, from the several effects I observed, that the focus has been cut too short ; a defect which would seriously affect the spherical aberration of the outer or object lens and its dispersion : and this would account for the fluid refractor not performing better than the flint-glass one, without impugning the corrective powers of the sulphuret of carbon, or its skilful application by the scientific Professor.

April 4, 1833.

W. H. SMYTH.

A paper was then read, entitled, " An Account of some Experiments made in the West Indies and North America, to determine the relative Magnetic Forces, in the years 1831, 32, and 33." By the Rev. George Fisher, M.A., F.R.S.

The experiments of which the results are given in this paper were made by Mr. James Napier, late Master of H. M. S. Winchester. The needles were precisely similar to those used in the experiments described by the author in a former paper ; and the observations were made with great care, and repeated several times at the same places ; by which it appeared that the intensities of the needles continued unchanged during the whole period of the experiments ; and the mean of all those made at one place was taken as the result. From these the relative forces at different places were computed, and stated in the form of a table.

A paper was also read, entitled, " On the Theory of the Moon." By John William Lubbock, Esq., V.P. and Treas. R.S.

M. Poisson, in a memoir which he has lately published on the Theory of the Moon, expresses the three coordinates of her path, namely, her true longitude, her distances, and her true latitude, in terms of the time. The author observes that the reasons for so doing adduced by M. Poisson, are the same as those which led Mr. Lubbock also to deviate from the course which had previously been always pursued by mathematicians, and to employ equations in which the true longitude is the independent variable. Instead, however, of integrating the equations of motion by the method of indeterminate coefficients, as the author had proposed, M. Poisson recommends the adoption of the method of the variation of the elliptic constants. In the present paper, Mr. Lubbock states the reasons which have determined him not to employ the latter method, founded chiefly on the advantages of obtaining complete uniformity in the methods used in the theories

of the moon and of the planets, and also in that of a greater rapidity of approximation by the improvements introduced in these methods.

Laplace, in the *Mécanique Céleste*, alludes to an equation of long period, of which the argument is twice the longitude of the moon's node, plus the longitude of her perigee, minus three times the longitude of the sun's perigee; and M. Poisson has shown that the coefficient of the corresponding argument in the development of the disturbing function equals zero: but the author shows that the same result may be arrived at very simply, by means of the method of developing the variation of the disturbing function.

December 19, 1833.

MARK ISAMBARD BRUNEL, Esq., Vice-President, in the Chair.

A paper was read, entitled, "On the Position of the North Magnetic Pole." By Commander James Clark Ross, R.N., F.R.S.

The author remarks that the discordances in former observations made with a view to determine the position of the magnetic pole, have arisen partly from the irregularity of distribution in the earth of the substances which exert magnetic power, and partly from the great distances from the magnetic poles at which these observations have been made. The latter cause of uncertainty has been now, in a great measure, removed, by the numerous and accurate observations made during the late arctic expeditions. The object of the present paper is to put on record those which were made in the last voyage of Captain Ross, in which a spot was reached corresponding to the true north magnetic pole on the surface of the earth. The nature of the instruments, and the difficulties encountered in their practical employment, under the circumstances of the expedition, are fully stated. Having arrived, on the 1st of June, at north latitude  $70^{\circ} 5' 17''$ , and west longitude  $96^{\circ} 45' 48''$ , the horizontal magnetic needle exhibited no determinate directive tendency, and the dipping needle was within a minute of the vertical position, a quantity which may be supposed to come within the limits of the errors of observation; hence the author concludes that this spot may be considered as the true magnetic pole, or as a very near approximation to it, as far, at least, as could be ascertained with the limited means of determination of which he was then in possession.

A table of the observations, including those on the intensity of the magnetic force at various stations, is subjoined.

A paper was also read, entitled, "On the Quantity and Quality of the Gases disengaged from the Thermal Spring which supplies the King's Bath, in the City of Bath." By Charles G. B. Daubeny, M.D., F.R.S., Professor of Chemistry in the University of Oxford.

The author, pursuant to an intention expressed in a former paper read to the Society, undertook a series of experiments, for the purpose of measuring the gas evolved from the thermal springs at Bath during